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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,758	09/04/2001	Vadim Y. Banine	P 282980 P-0202.011-US	8495

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EXAMINER

NGUYEN, LAM S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 01/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,758

Applicant(s)

BANINE ET AL.

Examiner

LAM S NGUYEN

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspond nce addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 13 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

Claim 13 is objected to because of the following informalities: The method claim 13 is inappropriately dependent on the apparatus claim 9. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 16 recites the limitation "the alcohol" in "wherein the alcohol is ethanol". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

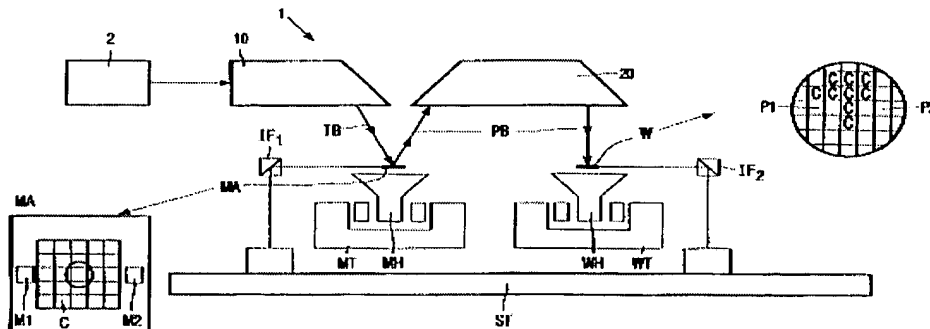
- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
2. Claims 1-12, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bisschops et al. (US 6304630) in view of Fujioka et al. (US 5593800).

Bisschops et al. disclose a lithographic projection apparatus (FIG. 2) comprising:

- a radiation system to supply a projection beam of radiation (FIG. 2, element PB);
- a support structure adapted to support patterning structure (FIG. 2, elements MT, MH) which can be used to pattern the projection beam according to a desired pattern (FIG. 2);
- a substrate table to hold a substrate (FIG. 1, elements WH and W);
- a projection system to project the patterned beam onto a target portion of the

substrate (FIG. 2, element 20);

a gas supply, configured and arranged to supply a gaseous hydrocarbon (FIG. 3, element 32 and column 5, line 52-55) to a space containing a mirror (FIG. 3, element 49);



Referring to claim 2: wherein the radiation system contains said space containing the mirror (FIG. 3, element 49).

Referring to claims 3-6: wherein the radiation system comprising one of a laser-produced plasma source and a discharge source adapted to supply a beam of extreme ultraviolet (EUV) radiation (FIG. 3 and column 7, line 46 to column 8, line 39) as said projection beam having a wavelength of less than about 50nm, or in the range of from 8 to 20nm, or in the range is from 9 to 16 nm (column 8, line 34-36).

Referring to claims 7-8, 11-12: wherein the hydrocarbon is an ethanol alcohol (column 10, line 52).

Referring to claim 9: wherein the mirror is a collector mirror (column 8, line 40).

Bisschops et al. does not disclose the comprising of at least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of said mirror and a pressure sensor to monitor a background pressure in said space and a gas supply control, responsive to a signal from said at least one sensor to control the gas supply.

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However, Fujioka et al. disclose the comprising of at least one sensor selected from the group comprising a reflectivity sensor to monitor a reflectivity of a mirror (column 16, line 55-61) and a pressure sensor to monitor a background pressure in a space (Column 16, line 9-16, line 45-51) and a gas supply control, responsive to a signal from said at least one sensor to control the gas supply (column 17, line 4-31).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to include the group of the reflectivity sensor to monitor a reflectivity of a mirror, the pressure sensor to monitor a background pressure in the source space, and the gas supply control responsive to a signal from at least one of sensors to control the gas supply as disclosed by Fujioka et al. into the source space in the radiation source unit as disclosed by Bisschops et al. The motivation of doing so is to provide an improved mask manufacturing method or an improved mask manufacturing apparatus by which enhanced X-ray mask positional precision of pattern precision is practically assured and which meets the requirement of practical mass production of X-ray masks as taught by Fujioka et al. (column 2, line 45-51).

Allowable Subject Matter

3. Claims 13, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Referring to claim 15: The most pertinent arts Bisschops et al. (US 6304630) and Fujioka et al. (US 5593800) fail to disclose wherein the alcohol forms a cap layer on said mirror and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to achieve a

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thickness of said cap layer which does not increase substantially over time. Therefore, the claimed invention is not disclosed by the prior arts.

Referring to claim 13: Assumed that claim 13 depends on claim 10, claim 13 is allowable because the most pertinent arts Bisschops et al. (US 6304630) and Fujioka et al. (US 5593800) fail to disclose the comprising of adapting the amount of gaseous hydrocarbon supplied to the space such that at least part of at least a top layer of said mirror undergoes sputtering. Therefore, the claimed invention is not disclosed by the prior arts.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BARLOW can be reached on (703)308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN
January 7, 2003


John Barlow
Supervisory Patent Examiner
Technology Center 2800